large centres of population and can see the result of such incompetency, it is next to impossible to convince the average country members that any danger exists. . . . The Council interviewed the Government two weeks ago and have reason to believe that we may succeed in having the Act amended by the striking-out of the word "registered" where it occurs in the Act, if each member will do his duty in the premises. . . ."

The President went on to review the work of the examinations, and pointed out the necessity of this work being effectively carried out, both for the objects of the Association and for the benefit of the members individually, who would have the advantage of being able to obtain trained assistants ready for their work, instead of having to educate them for themselves. Some seemed to consider that it was an expense which the Association should not have to bear — that students should pay a sufficient sum to clear all the costs; but it was evident that if the student were asked to pay high fees he would not come forward, and the work of education would be blocked at the outset. The address then referred to the library of the Association, and regret was expressed that members had not made such practical use of it as they might have done. The library was small at present, but it was the intention of the Council to purchase, by degrees, such books as could not, as a rule, be bought by architects individually on account of their expense. The practice by which members living at a distance could have these books sent them by paying the postage made the library as accessible to them as to city members, and would undoubtedly prove an inestimable benefit to them. "The Council was instructed at the last convention to determine what could be done to protect an architect's design from being used by a second party without compensation." Under the present Copyright Law, the sub-committee which had dealt with the subject found that nothing could be done to remedy the evil.

The President then dealt with the various occasions upon which the Council had acted in reference to appointing members to assist the promoters of competitions in coming to fair and satisfactory conclusions, to the various subjects upon which deputations from the Association had been to Ottawa to interview ministers in connection with the objects of the Association, and dealt at large with the subject of fees to be paid by members, some feeling having been shown by members who did not really comprehend the nature of the work done and to be done by the Association that the fees were higher than necessary. In conclusion, the President referred feelingly to the death of the late president, Mr. W. G. Storm, who had worked so earnestly for the advancement of the Association, even to the sacrifice of his material interests.

The reports of the Treasurer, Registrar and Librarian were then read, followed by the report of the Council, whose work has been practically outlined by the notes given above of the President's address.

A considerable amount of discussion followed upon "business arising out of the minutes," which was, perhaps, of local rather than general interest, and need not here be entered into; and the meeting adjourned, the members being well satisfied as to the work accomplished in the first afternoon of the convention.

In the morning of the second day a paper was read on "Iron Fireproof Construction in New York," and some tests of material were made on the machines of the School of Practical Science, in which building the convention was being held. In the afternoon session Mr. Gregg brought forward a scheme for dividing the Province of Ontario into sections in which "Chapters of the Association should be formed." The matter was very thoroughly discussed, but it was decided that, while it would be well to have some such scheme carried out in the future, it was as yet somewhat too early for its inauguration.

It was decided to change the time of the annual convention to January instead of February, the date decided on being the second Tuesday in the month. Voting by letter-ballot was then taken up. Mr. Arnoldi, from Ottawa, represented that there were sixteen members in Ottawa, of whom he was the only one able to come up, and that, while they took great interest in the work of the Association, they were debarred by the existing rules from voting in the elections. The motion to have the by-laws changed to admit of voting by letter-ballot was, however, lost, it being the general opinion that if this were permitted one incentive to attendance at the convention would be lost, and that it would tend to reduce the attendance very materially.

In connection with the library, an important direction was made to the Council, which was that they were empowered to invest a sum of money out of the capital of the Association in the purchase of books. When all the business had been disposed of the elections were proceeded with, resulting in the return of Messrs. Frank Darling, David B. Dick and Edwards (of Hamilton) to fill the positions of the three retiring officers. Mr. D. B. Dick was elected president of the Council. The proceedings terminated with sundry votes of thanks. The city members gave a dinner in the evening to their *confrères* from the country.

One very important proceeding of the convention was the reading of the report on "Building-stones of the Country," prepared by the sub-committee appointed for that purpose some time ago. This is a very important document and great labor has been expended upon its production, the intention being that the results of the tests made shall be printed in book-form and circulated for the information of those interested. We could not give the matter in full, the tables themselves would take up more space than this whole letter, but we may make a few notes. The report concludes with the clause, "Specimens of all the stones tested have been preserved and a complete set of these, together with all data connected with the tests, including, in most cases, photographs of the stones broken, will be kept at the School of Practical Science and at the offices of the Association for the benefit of those wishing further details." The tests were conducted at the School, "the stones first sawn into cubes, set in plaster-of-Paris in a steel frame made for the purpose, and brought to perfectly parallel faces by rubbing." The report describes twenty-six kinds of stone, each one from a different quarry, and four tests were made of each kind. Of the twenty-six kinds, fourteen were sandstones, eight limestones, one dolomitic limestone and three granites. With each stone a full description is given of its formation, chemical analysis, color, location of quarry and means of shipment or transportation, and in tabulated form, its dimensions, crushing-load, crushing-stress per square inch, and the average crushing-stress of the four specimens per square inch. This report is a very valuable production of the Association and should prove of great value to all interested in building operations. It is intended to continue the work of testing specimens whenever there are any to test and to have in time a complete list with full particulars of every stone in the country.

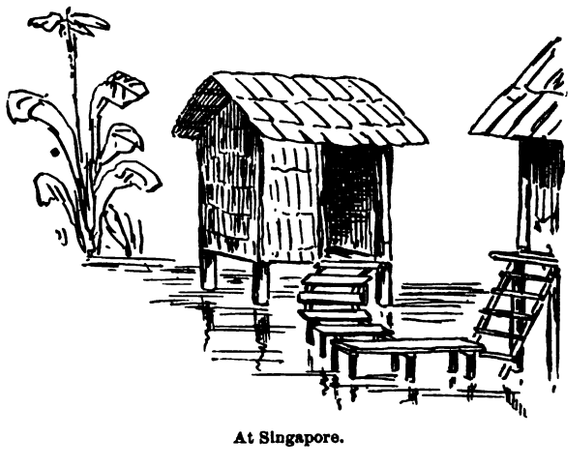
A number of local manufacturers invited the architects holding the convention to visit their establishments in a body, and provided sleighs for the purpose, an extra day being taken up by these very interesting and instructive proceedings, the country members being especially benefited by the visits.

The next events in connection with the Association will be the examinations which are to take place in the second week of March.

The American Institute of Mining Engineers held its annual convention in Montreal, in the new Physics Building of the McGill University, Montreal, on February 22d and 23d. Mr. John Birkenhead, of Philadelphia, was in the chair, Doctor Raymond, of New York, acting as secretary. The report of the Council was read. The Association is in a very flourishing condition, having a surplus of $3,463 odd, an increase of $1,750 over the surplus of last year, in addition to which there are in possession of the society certain Government bonds representing nearly $5,000, and others having a par value of $2,900. As regards membership, there have been one Honorary Member, 225 Ordinary Members and 30 Associates elected in the past year; 9 Associates have become Members, and 7 who were in arrears have been reinstated; 4 Foreign, 20 Ordinary Members; 3 Associates have been removed by death, while 25 Members and 4 Associates have resigned; 53 Members and one Associate have lapsed through non-payment of dues. The total membership now is 2,376. At the Chicago Exhibition the Association will have charge of the two divisions of mining and metallurgy of the International Engineering Congress, which will be held on July 31st, at which this Association will meet, and the meeting will be considered as one of the regular gatherings of the society. Several papers were read of a technical character, Major Powell, of the United States Geological Survey, reading one on "The Geological Map of the United States." The following officers were elected for the ensuing year: *President*, Henry M. Howe, Boston; *Vice-Presidents*, A. J. Bowie, Jr., San Francisco, R. G. Leckie, N. S., E. G. Spilsbury, New York; *Treasurer*, T. D. Rand, Philadelphia; *Secretary*, R. W. Raymond, New York.

The Canadian Society of Civil Engineers also held its annual convention on February 23d, under the presidency of Mr. J. Kennedy. The election of officers resulted in the return of E. P. Hannaford as *President;* Thos. Munro, P. A. Peterson, W. T. Jennings, *Vice-Presidents;* C. H. McLeod, *Secretary;* W. McNab, *Librarian.*

LATRINES OF THE EAST.



At Singapore.

THE proper disposal of human excreta is a subject of vital importance and is to-day occupying the attention of municipalities the world over. The subject has its economic and sanitary side. The question of waste and consequent impoverishment of the

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land, with the masses reduced to paupers, gave little concern to the rulers, but when a connection was established between this material and infectious diseases which invaded the homes of the people, then the matter aroused interest and questions of public health enlisted the attention of thoughtful men.

Sanitation is a science of recent development. The terms sanitary-laws, sanitary-engineers, health-officers, etc., were hardly known a generation ago. The pages of advertisements, with their accompanying illustrations of porcelain bowls, syphon-traps, flushing-tanks, ventilating-pipes, call our attention to devices of recent origin. Plumbing has become a new profession — a science, in fact, since the enlightenment of the public on sanitary matters.

The latrines of a hotel, once so cold, dark and noisome, are now white marble halls, warmed and well lighted: in fact this region, once the most offensive feature of a public-house, is now, in all well-appointed hotels, not only the cleanest part of the building, but the air is purer there than in any other part of the structure. It is the only region where one does not detect the characteristic "hotel odor."

As a nation we pride ourselves on being far ahead of the world in the appointments of the latrine. This superiority, however, is confined to city populations possessing modern forms of water-supply and drainage. The common houses of the people, however, in our northern cities, at least, are usually better provided in these respects than many a fine house abroad.

Realizing the enlightened opinion concerning these matters in this country, it may be a matter of curious interest to inquire into the ways of Eastern people. While some of the Eastern nations are far in advance in the personal cleanliness associated with the disposition and utilization of sewage, using this term in its most restricted sense, other nations are offensive to the last degree. Indeed one is not compelled to leave Europe to find noisome conditions, and if one reverts to the habits of Europeans hardly more than a century ago he finds revealed a depravity only paralleled in China and certain parts of Russia to-day.

Aside from the curious interest that may attach to this subject there is a far more vital interest in the bearing the subject has upon public health. The question of a wholesome water-supply, whether pumped from the domestic well or distributed from larger sources by the commune, affects at once the life and health of the citizen. The fact that these supplies can be infected by germs of enteric disease is one that is established beyond refutation. The manner of the disposal of house-sewage is, therefore, one of vital importance, and if it can be shown that these nations whose methods are vicious in these respects are the ones that suffer from such diseases as a vitiated water-supply might induce, it will strengthen communities in their efforts to insure an uncontaminated source.

The nations of Europe stand in periodical dread of cholera from the regions lying east of them. The Orient stands as a continual menace to the nations of Europe, and the time may not be far distant when a propaganda in the interests of sanitary science shall invade these countries with their missionaries of hygiene to teach the people the gospel of cleanliness. That the masses might be ready to receive such teaching is shown by the success accompanying the efforts of medical missionaries beyond that of those who teach dogma alone.

With the threatened invasion of cholera and the undeniable fact that the dread disease comes from the East, an added reason is given for a glance at the methods in vogue for the disposal of egesta in these far-off countries.

China, from its enormous area and dense population, offers one of the most interesting fields for those interested in sanitary science. In no other part of the world, unless it be in Russia, can such depths of filthiness be found as in the cities of China. Mr. Arthur H.

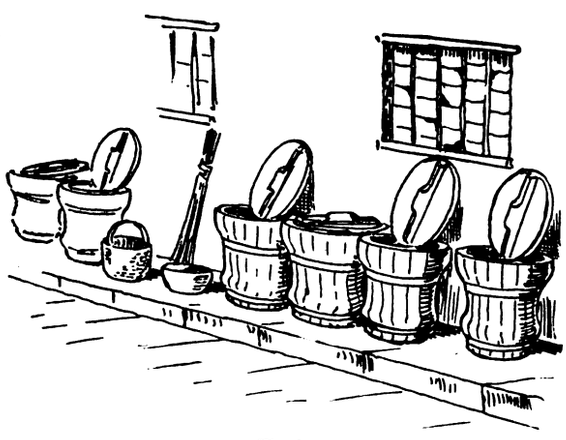

Fig. 1.

Smith, in his interesting work entitled "*Chinese Characteristics*," says that, "no matter how long one has lived in China, he remains in a condition of mental suspense, unable to decide that most interesting question, so often raised, Which is the filthiest city in the Empire? . . . The traveller thinks he has found the worst Chinese city when he has inspected Foochow, he is certain of it when he visits Ningpo, and doubly sure on arriving at Tiensin, yet after all it will not be strange if he heartily recants when he reviews with candor and impartiality the claims of Pekin!"

Dr. Robert Coltman, in his valuable book, "*The Chinese*," calls attention to the existence of various forms of enteric disease, and,

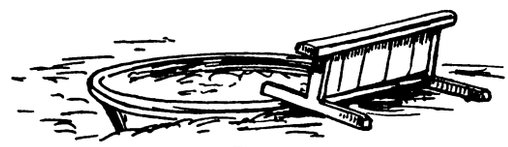

Fig. 2.

with other observers, notes that the Chinese are utterly ignorant of the germ-theory of disease, and, consequently, the persistent violation of all sanitary laws follows as a matter of course. The experience of centuries has taught them that water can be drunk in safety only after it has been boiled, an experience similar to that which has taught them that an emersion in the same fluid for several minutes would be equally disastrous to life. Doctor Coltman says, "they would look with horror at a foreigner drinking a glass of cold water," and he admits that after several severe sicknesses in his own family from drinking what he considered ordinarily pure water, he was forced, ever after, to drink only boiled water, tea or coffee. Despite these precautions, however, on the part of the natives, "cholera occurs as an epidemic every few years and is frightfully fatal. The ports seem to be affected the most, but in the summer of 1888 a wide-spread epidemic swept through Shantung and Chihli, from east to west, sweeping away thousands of lives."

In the *American Architect*, No. 859, an interesting extract is published from the report of Ernest Norfleet, past-assistant surgeon, U. S. A., entitled "Conservation of Filth in Chinese Cities." Speaking of Canton, he says: "The drainage is naturally bad, and what there is consists of several large canals that penetrate the city from the river and receive the filth from smaller canals and street-gutters emptying into them; but all these become greatly choked, and, notwithstanding the daily rise and fall of the tide, the city everywhere reeks with odors of the vilest sort, *i. e.*, to Christian noses. The natives do not seem to notice them at all. Their water-supply is taken from the river and from wells and a few springs on the north side. The wells must be saturated with the filth that seeps into them from the adjoining soil, for they are fed from the rainfall for the most part; but it is always boiled, and drunk in the form of tea or consumed in soups."

The comparative freedom of the Cantonese from enteric diseases is believed to be due to the rise and fall of the tide twice a day, the heavy rainfalls which wash out the rottenness from the porous soil, the universal outdoor work of the people, the open shops and houses, and, above all, the universal habit of boiling the water before drinking. Doctor Norfleet calls attention to the scrupulous way in which ordure is saved, and, as a consequence, pollutes the soil but little. As a matter of fact, this material is put upon the rice-fields in a fluid condition and every rainfall must wash the stuff into the neighboring canals and rivers. And here we may refer to the strenuous protests made by Dr. Letheby, of England, some years ago, against sewage irrigation, showing the grave dangers which would result.

Among the teeming millions in China, there is every reason to believe that a struggle for existence has gone on for centuries, killing off those who could not stand the microbes and bacilli of certain kinds, and, as a result, the survivors are proof against conditions that would instantly depopulate one of our cities.

Enough has been said to show the extreme filth of Chinese cities, yet I must add my own brief experience, as that will enable me to present some further details. At Shanghai, as one enters the native town he encounters men bearing uncovered buckets upon the ends of a carrying-stick; these are the removers of night-soil, and they have their regular routes through the city. If one follows these scavengers he sees them going to the banks of a canal near by and emptying the buckets with a splash into a long scow, or other kind of boat, which, after being filled, is towed away to the rice-fields in the country. The stuff is often spilled in the water by careless emptying. The canal has no current, at least not enough to disturb the green ooze and sickly yellow condition of the water, which is thick with foulness; yet beside this boat people are dipping up the water for drinking and culinary purposes. Small-pox, at the time of my visit, was epidemic in the town, and I brushed past men in the narrow alleys who were covered with eruptions; everywhere the ground was slimy with filth, and the state of the town was indescribable.

I spent a few days within the city, in the care of a Chinese student, and was permitted to make many sketches of Chinese apartments. It would seem that in the better class of houses each room is provided with a large wooden bucket with close-fitting cover. These buckets are emptied every day by a man who makes the rounds for the purpose. They are scrubbed by the aid of small shells (*Arca granosa*) which have upon them numerous ribs and nodules. A small basketful is emptied into the bucket and a stiff bundle of bamboo switches is used to stir them about. Rows of these buckets may be seen airing in the back-yard — a suggestion of cleanliness that should be recognized, in spite of the revolting idea of ever having such receptacles in the house over night (Fig. 1). The men

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who remove this material are often encountered in the narrow streets, and it requires some alertness and skill to avoid being brushed by them, as they move by you in the roughest way with buckets swinging. In the back-yard of a number of houses I saw large earthen jars embedded in the ground. Against the sides of these jars was a low framework of wood (Fig. 2), and, barring a shelter above, the whole affair had all the primitive simplicity of similar conveniences all over this country. Near these places were piles of ashes from the stoves, and these were scattered over the material at times. The open character of this arrangement, while offensive to the eye, was better, in a sanitary sense, than the ordinary privy in this country, which, having its receptacle sunk in the loose soil, soon leads to the pollution of the ground and finally of the water-supply itself. Square urinals made of stoneware are occasionally seen. These are used by old people, and I was told that they also served as pillows or head-rests (Fig. 3).

Fig. 3.

In Canton the latrines are public, comparatively few houses having private ones. Wooden buckets are used in the house by women, as is the custom farther north, but the men go to the public places. As one walks through the streets of Canton the existence of these latrines is always evident to the nostrils. Occasionally he gets glimpses of these places through an open door which leads into a narrow court, and here on each side, in the filthiest possible condition imaginable, is a long row of low stalls closed by doors. A deep, stone gutter runs the length of the place, close to the wall. Across this, in each stall, are secured two narrow planks, and just in front a narrow gutter runs to carry away the urine (Fig. 4). The whole structure was solid, durable and well-built, and, with the faintest notions of cleanliness among the people, would have been much better than similar public arrangements at home. With a supply of running water in each gutter, the plan might be adopted for public latrines in this country without the slightest modification.

Our public latrines and those connected with railroad stations, while vastly better than formerly, are in many cases far from what they ought to be. A plan of a public latrine such as the one just described, or such as one may find in Constantinople, consisting of the simplest possible arrangements and devoid of all seats, is the only true sanitary device for decent people so long as one indecent person has the privilege of access to it.

Widely distributed in the city were large earthen jars bedded in the ground, and these were the public urinals.

From what I have been able to learn from Korean friends, the

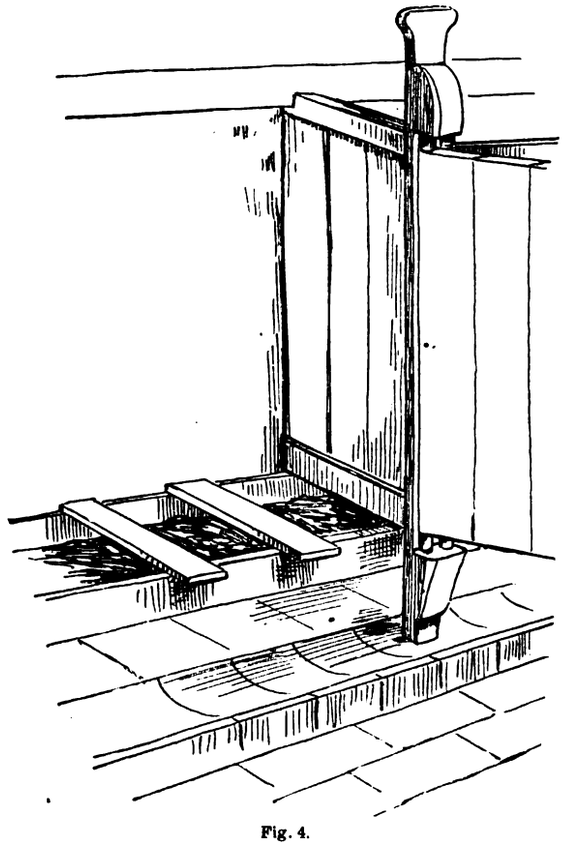
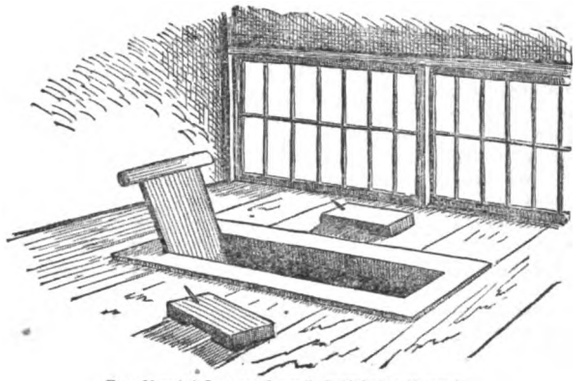


Fig. 4.

conditions in Korea are similar to those in China. Carles, in his "*Life in Korea*," says that near Soül he saw women washing clothes in a stream, and, "though the stream was low and its bed served as a dung heap, water was also being carried away from it for household uses, and there was evidence on every side that, according to all rules of sanitation, the population should by right have ceased to exist."

Japan forms a most striking contrast to China and Korea in these matters; not only does every house have its privy, but there are public latrines as well. In every house, except among the poorest



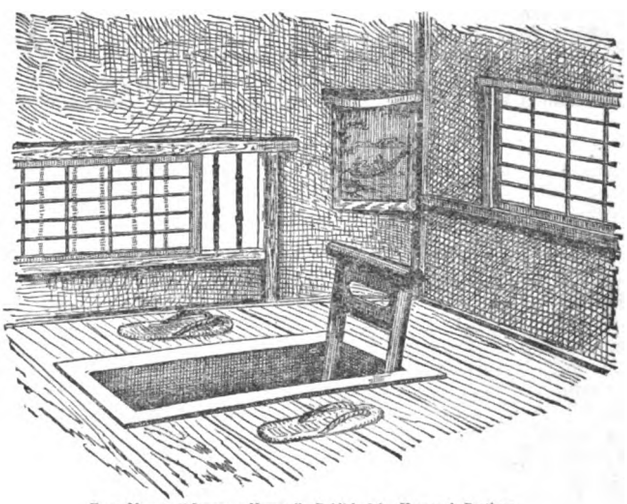
From Morse's "Japanese Homes."—Published by Harper & Brothers.—Copyright, 1885, by Edward S. Morse.

Fig. 5.

classes, one finds in the immediate vicinity of a privy a receptacle for water and a towel, which is always used for hand-washing. In the country, one often sees in the neighborhood of the poorer class of houses a covered place closed by a low door. A clever drawing of Hokusai shows that it is not beneath the dignity of a lord to avail himself of this humble convenience. Receptacles in the form of large jars or buckets are found near the rice-fields. The scrupulous care shown in the preservation of this important fertilizer is in striking contrast to the way in which we wastefully discharge it, thus polluting air and water. Frederick Charles Krepp, in his exhaustive treatise entitled "*The Sewage Question*," shows the calamities which have overtaken communities and nations who have permitted this material to go to waste. Lowell and Lawrence with their typhoid fever, and Chicago with its overwhelming problem before it, show how far we are yet from dealing properly with this great and perplexing question.

The Japanese, while utilizing this material, nevertheless contaminate their water-supply, for the irrigating material soon finds its way to the rivers, and though the danger of drinking water seems less in Japan than in China, experience has taught the Japanese to drink the water boiled or in the form of tea.

The floor of the privy has simply a rectangular opening, as shown in Figures 5 and 6, which have been taken from my book on "*Japanese Homes.*" The receptacle below consists of a large earthen jar or the half of an oil barrel. This is sunk in the ground and emptied every few days by means of a long-handled bucket from the outside. The men who are engaged in this work have their regular routes and pay for the privilege. It seems incredible that a large city like Tokio, with its million of inhabitants, has this service performed in the most thorough manner. Indeed, so valuable is this substance that in Hiroshima, I was informed, in the renting of the poorer houses, if three persons occupied a room together the value of this



From Morse's "Japanese Homes."—Published by Harper & Brothers. Copyright, 1885, by Edward S. Morse.

Fig. 6.

product paid for the rent of one, and if five occupied the room no rent was charged.

The result of the transference of this material into the country leaves the shores of a city absolutely pure. No malarious flats nor noisome odors, arising from littoral areas, curse the inhabitants, as with us.

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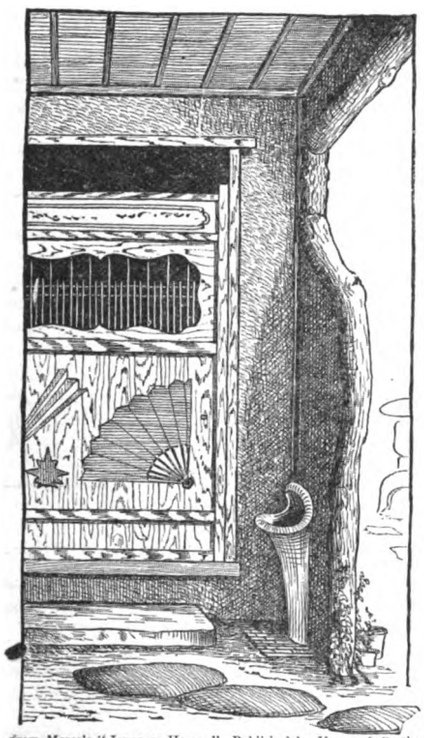
In crowded inns much discomfort arises from the odors of the latrine, and even in the better class of houses the privy, being at the end of the veranda, is often perceptible; on the other hand, many of these places might properly be called cabinets, so exquisitely clean and beautiful is the woodwork inside and out. Figure 7, also from "*Japanese Homes*," represents the door of a privy in Tokio. This was inlaid in designs in different-colored woods, and the whole affair was a dainty bit of cabinet-work.

The urinal is usually of wood, though porcelain ones are often seen. The wooden ones are in the form of a tapering box secured against the wall of the closet. Sometimes sprays of a sweet-scented shrub are placed in these and often replaced. The refinement of the Japanese in these matters is shown by the various names applied by them to the privy, such as — *Setsu-in*, snow-hide, *Chōdzu-ba*, place to wash hands, *Ben-jo* and *Yō-ba*, place for business, *Koka*, back frame, etc.

There are certain superstitions associated with the latrine in Japan: one is in regard to the position it must be in relation to the house, the question of prevailing winds never entering into the matter. I was told that a tree called *nanten*, which bears a red berry, is often planted near the privy. Formerly it was believed that an imaginary animal called *Baku* came to eat this fruit, and also had the power of absorbing bad dreams, hence those using the closet would have their bad dreams dispelled.

On the Malay Peninsular a few closed privies are seen among the natives. By those living over the water a definite shelter supported on poles is built. This is somewhat removed from the house, a little bridge running to it, as shown in the initial cut. The floor of the convenience is constructed of a few boards with wide interspaces between. On dry land a hole is excavated and sometimes an earthen jar is bedded in the ground, over which a few boards are placed.



From Morse's "Japanese Homes."—Published by Harper & Brothers. Copyright, 1885, by Edward S. Morse.

Fig. 7.

In Siam, among the poorer classes, the privy is erected on a framework over running water, usually without covering, being a mere staging. The custom of erecting a staging over running water seems to be common among the people from Bankok to Singapore.

In this connection it is interesting to consider the ancient form of latrine in Japan. Prof. Basil Hall Chamberlain, in his translation of "*Kojiki, or Records of Ancient Matters*," which runs back twelve hundred years or more, shows that in this record the latrine is mentioned several times as being away from the house, and as having been placed over running water, "whence, doubtless, the name *kahaya;* that is, *river-house.*" I may add to this the suggestion that formerly the Japanese privy was uncovered, like the Siamese type before mentioned, as the curious board that stands up at one end of the usual rectangular opening has a name in Japanese which implies this.

It would seem that in Siam and adjacent regions suffering from periodic scourges of cholera every condition for the wide dissemination of this disease was embraced. Thus, at Bankok, not only are the latrines scattered along the river, but the bodies of those dying of cholera are denied the usual cremation, and are thrown into the river or are given to the vultures, because it is supposed that the devil has been the immediate cause of their death.

Gross negligence in disposing of egesta in these hot regions is not followed by the dire evils that would result from similar methods in colder climates. In Egypt, for example, the native resorts to the desert, where the hot sun, aided by swarms of insects, soon obliterates all traces of the substance.

The natives of Sumatra and Java resort to running water, the same water being used for drinking and all domestic purposes. The banks of these streams in Java will be occupied by women washing clothes as well. When latrines are built near the inns or larger houses in Java, a bottle of water takes the place of toilet-paper, and the act of ablution is always performed by the left hand, consequently, the proffering of the left hand in salutation or other act is considered a gross insult.

In certain parts of India, I was informed that gardens and open lots formed the only conveniences for latrines, pigs acting as scavengers. In Ceylon, the wealthier classes have latrines near the house, but the poorer classes resort to the garden or retreat to the underbrush near by. In many of our Southern and Western States, outside the larger towns, and in Central and South America, the same custom prevails.

In Northern Russia, as I was informed by an intelligent Russian, alien nationalities are usually very filthy in their ways, having no conveniences whatever. In Southern Russia, on the contrary, little houses are constructed in basket-work fashion and of basket material — door, roof and all. Within is a circular opening, or a wide interspace between the planks forming the floor.

If anything would warrant a rigid quarantine against the Russian emigrant, the following extract from an article entitled "Cholera and Cleanliness in Russia" (Mr. E. B. Lanin in the *Fortnightly Review*, Vol. LII, n. s., p. 212) would certainly justify such an attitude. In speaking of inns and public-houses, the writer quotes as follows: "'The interior of these establishments,' says the semi-official journal, 'displays an inexhaustible store of disgusting foulness, eloquent signs and specimens of which cover the walls, the windows, the tables, the floors and the kitchen. The whole place is permeated with abominable smells and venomous exhalations ruinous to health. At first the atmosphere stupefies the visitor, then produces giddiness and sickness. The unpaved yards of these establishments are mere *cloacas* abounding in miasms, in the thick of which wagon-loads of fish, game and vessels containing fresh milk are left standing for considerable periods. The provisions thus conveyed in filthy vehicles and impregnated with this mephitic atmosphere cannot but sow disease-germs broadcast among the population. If to all this we add the utter absence of those elementary sanitary conveniences with which all human habitations ought to be supplied, or, what is much worse than their absence, the existence of substitutes into which it is impossible to enter, and in the vicinity of which it is dangerous to pass, we shall be better qualified to form an idea of what these nurseries of disease termed inns and public places are like.'" The writer then goes on to say: "The hygienic condition of yards, streets and public places is on a level with that of private dwellings, and the excreted refuse of houses, which, in European towns, is made to disappear as rapidly, opportunely and mysteriously as a suspected subject of the Tsar's is left as inviolate as if it were a sacrifice to the unclean gods. 'Even in our two capitals, the method of removing refuse and impurities is so antediluvian that it would be an abuse of terms to allude to it as sanitation. In the most favorable cases, the "system" consists in digging a big hole in the yard of every house and throwing into it all the garbage, offal, etc., and leaving it undisturbed for months, and for longer terms than months, until at last it is carted off in boxes and barrels to some place outside the city. It is easy to imagine to what extent the soil is permeated with filth and the atmosphere vitiated with miasms, and in what an Eldorado the microbes of infectious diseases revel. And it must be noted that even this "system," defective as it is, is followed only in favorable cases, *i. e.*, when private houses are provided with closets. As to the "system" pursued when there are no water-pipes and water is dear, it is better not to speak of it. It is a horror.'

"In Staraia Russa, Kiriloff, Tsherepovets, etc., 'cesspools are constructed under the floors of the houses'; in Samara, 'the river-banks consist of solid filth sprinkled over on the top with sand'; 'the streets of Irkhutsk are made pestilential by the putrid carcasses of dogs and cats lying half-buried in mounds of ordure'; 'the city of Veronesh is saturated with filth, the excreted impurities of the barracks oozing out into the river, on the surface of which dead dogs are occasionally seen floating about'; in Elizabethpol, 'the carcasses of dogs and cats lie undisturbed on the streets in considerable numbers.' In the most widely-circulated newspaper of Kharkoff, a city of over 200,000 inhabitants, we read among the advertisements: 'House for sale: exclusively owing to the circumstance that nearly all the neighboring house-proprietors continually throw foul water and every species of filth into the streets. Address: Pesski, Ivanovsky Street, No. 25.'"

From all that I can learn, the Greeks are equally vile in these respects, though the hot climate tempers their offences somewhat. In an extraordinary work entitled "*Scatologic Rites of all Nations*," by Capt. John G. Burke, U. S. A., a work overflowing with curious ethnological material, I find a number of allusions as to the means of disposing of excreta in different parts of the world, and these are here subjoined: "Tartars do not abide long in one place. New camps are established from time to time, to avoid the accumulations that have taken place." The Tungouses of Siberia told a traveller that "they knew no greater curse than to live in one place, like a Russian or a Yakut, where filth accumulates and fills the inhabitants with stench and disease."

According to Hawkesworth's voyages, no privies existed in Madrid till 1760, and the determination of the king to introduce these conveniences, as well as sewers, and to prevent the throwing of human ordure out of windows after nightfall, as had been the custom, nearly precipitated a revolution. Edinburgh, among other cities,

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was long notorious for this disgusting practice. Privies were ordered for each house in Paris in 1513. In England, privies connected with houses of the gentry appeared in the latter part of the sixteenth century. In ancient Rome there were public latrines, but no conveniences attached to the dwellings. Portable vessels began to be used in England in 1590, and in this connection I may add that the use of these vessels excite a good deal of astonishment and disgust among the Japanese. An intelligent Japanese told me that when he first saw them he was much perplexed, and, in reflecting on the reason which led to their use by a people who seemed so sensitive and were so easily shocked by certain customs in Japan, came to the conclusion that it was owing to the coldness of the climate that led to so filthy a custom.

I have wondered what his conclusions were when he saw for the first time the typical rural device in our country, a fair description of which is here quoted from the "*Massachusetts State Board of Health Report*" (1874, p. 235):

"As to country privies, one of our correspondents has well said that they are 'a disgrace to civilization.' A philosophical friend of the State Board says that the march of civilization is in no way more correctly marked than by perfection in water-closets. If to this rule a universal application were given, it would place our farmers, as well as the vast majority of our rural population, well back in the ranks of barbarism. We prefer to believe that this is the only respect in which they are behindhand; but that they are so in this is very certain. The common country privy, unventilated, except by the door, standing over a reeking mass of corruption, either contained in a vault or lying upon the surface of the ground, a place foul and pestilential beyond description, — this must be the daily resort of every member of the farmer's family. If it adjoins the house, its poisonous odors penetrate to the living-rooms; if standing several rods away, as it frequently does, an exposure to the weather is involved in reaching it. In either case, in winter it is frightfully cold, and its use involves a chill, which, to women and children especially, coming from the warm rooms, is a potent cause of disease. Undoubtedly the constipation which is so general among country-women is in great part due to the dread of going to this abominable place."

Captain Burke, in speaking of the introduction of latrines, is of the opinion that their origin cannot be ascribed to purely hygienic considerations, since many nations of comparatively high development manage to get along without them, while, on the other hand, tribes in low stages of culture have resorted to them. He quotes Captain Cook as recording the fact that the New Zealanders had privies to every three or four houses, while the natives of Marquesas bury their egesta.

Reference is often made to the laws of hygiene recognized by the Jews as recorded in the Mosaic scriptures, such as matters connected with food, isolation of the sick, removal from camp of effete matters, etc. The burying of fæcal matter outside the camp limits is enjoined in Deuteronomy xxiii, 12, 13. This ordinance, though often quoted, does not seem to have been based on hygienic grounds, judging by the context, but solely that the Lord in walking through the camp should not have his eye offended by unclean things. The custom once established, for whatever reason, would naturally commend itself and survive, though, in the regions inhabited by the Jews at that time, the hot sun, dry air and swarms of insects would rapidly dissipate all matter of the kind.

A review of mankind throughout the world shows that only a small proportion have used even the simplest device for a latrine; an artificial device most probably arose from an agricultural and not from a hygienic necessity. The act of ingestion has been accompanied by a certain rude etiquette and with the aid of simple dishes often decorative, while the action of egestion still places the larger portion of the human race on a level with his simian relatives. In many civilized communities customs have prevailed which have resulted in grave diseases and frightful epidemics. We find at the top of another twig of mamalian descent a group of animals which has surpassed man in these matters. The cat buries its egesta. Even among nesting-birds, as the robin, the most scrupulous cleanliness prevails.

The tendency of civilization has been in the direction of better and cleaner methods. Sensitiveness to offensive conditions, like refinement in other ways, is a matter of evolution, and it can be said that the intellectural status of a community may be gauged by the advance it makes in disposing of waste-matters in a clean, wholesome and economical way.

Edward S. Morse.

THE STEVENS BICYCLE TOUR.

THE touring through France on bicycles, last summer, of the Stevens architectural party was a somewhat novel experience, and as their method of travel met with such delightful results and was in every way so thoroughly practical, an outline account of the trip, it is thought, may be of some general public interest.

Landing from one of the Royal Netherland mail-steamers at Boulogne, the party of twenty-three proceeded by rail directly to Amiens, from which point the cycle travelling began and was continued during the rest of the journey.

From Amiens the road lay in zig-zag route to Paris, from there down through the beautiful valley of the Loire, then north to Mont St. Michel and finally to Rouen, where, after having ridden nearly 1,000 miles, the company disbanded.

An itinerary for the entire trip of fifty days had been arranged before starting and only upon a few occasions was it found necessary to deviate from this prearranged programme.

Difficulties in the way of carrying sufficient luggage for a trip of such extent had been somewhat anticipated, but were easily overcome by the use of patent waterproof carriers strapped to the front of the wheel, and so arranged that the bundle could be quickly detached upon arriving at a hotel, the sketching-outfit or additional luggage being held in a flat case beneath the saddle, while those who had cameras carried them upon their backs or suspended from the shoulder. Possible inconveniences that might also have arisen through unfamiliarity with the road and strangeness of the country were amply provided against by the purchasing of department or road maps, which may be obtained in very complete and convenient form in all the principal towns.

The party was fortunate enough to have among their number, for a while, Joseph Pennell, who proved himself to be, if such a comparison could be made, as good a cycler as he is illustrator.

An accidental meeting with the artist, Ridgeway Knight, and the accepting of a kind invitation to spend a day at his charming home near Paris, added a pleasant and interesting leaf to the history of the trip.

The meeting with congenial countrymen in a foreign land is agreeable, to say the least, and later on at Vitré, R. C. Spencer, Jr., the Rotch scholar, was met with, who also was journeying upon a bicycle.

Many a fine château in France and not a few of its choicest bits of architecture lie away off the route of the traveller by rail, and can only be reached by a road conveyance or some such method as the one here chosen.

That it is more pleasant to spin over a strange and picturesque land in this healthful, exhilarating manner than to be whirled along over miles and miles of territory with utter disregard for its beauty and surroundings almost goes without saying. Not hampered by exacting inconvenient railway time-tables and the smoky, grimy unpleasantness of their coaches, a more thoroughly delightful method of travel could hardly be imagined. In fact, it seems to have been clearly demonstrated that in choosing the wheel a means of transportation had been selected as practical and inexpensive for its purpose as it was unique in its methods.

SOCIETIES

ENGINEERS' CLUB OF PHILADELPHIA.

AT the Business Meeting, March 4, 1893, Prof. Joseph T. Rothrock made the address of the evening, on "Wood-structure in its Relation to Mechanical Purposes," with the aid of photographs and sections of wood, projected by the lantern.

He explained the effect of cellular and woody fibre upon the strength and durability of the wood, pointing out the predominance of one or the other kinds of growth in different trees, and their consequent adaptability to different purposes.

He explained that while the so-called annual rings might be used in counting the life of a tree, in most cases this was not an invariable rule, and one might be misled in following it in some cases.

He closed by showing the distribution of the timber area in the State of Pennsylvania, and called attention to the necessity for better supervision for its protection.

His remarks were discussed at considerable length by Messrs. Birkinbine, Prince, Falkeneau, Wilfred Lewis and others.

Upon motion, a unanimous vote of thanks was tendered to Professor Rothrock for his interesting address.

THE ILLUSTRATIONS

[*Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.*]

WISSAHICKON INN, WISSAHICKON HEIGHTS, GERMANTOWN, PA. MESSRS. G. W. & W. D. HEWITT, ARCHITECTS, PHILADELPHIA, PA.

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SKETCHES MADE DURING THE STEVENS BICYCLE TOUR BY MR. ELMER GREY, MILWAUKEE, WIS.: THREE SHEETS.

[Issued with the International and Imperial Editions only.]

See article elsewhere in this issue.

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